REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-13 and 15-19 are currently pending. Claims 1 and 17 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter. Applicants note that the amendments to the claims are based on the amendments filed on October 11, 2007, which were indicated as being entered in the Advisory Action dated October 31, 2007.

In the outstanding Office Action Claims 1-12, 15, and 17-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,657,362 to Giger et al. (hereinafter "the '362 patent") in view of the Ohno-Machado et al. reference ("Modular Neural Networks for Medical Prognosis: Quantifying the Benefits of Combining Neural Networks for Survival Prediction"); Claims 13, 16, 18, and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the '362 patent and the Ohno-Machado et al. reference, further in view of U.S. Patent No. 6,282,305 to Huo et al. (hereinafter "the '305 patent"); and Claims 14, 18, and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the '362 patent and the Ohno-Machado et al. reference, further in view of Ravdin et al. ("A practical application of neural network analysis for predicting outcome of individual breast cancer patients").

Applicants wish to thank the Examiner for the interview granted Applicants' representative on January 8, 2008, at which time a proposed amendment to the claims was discussed. At the conclusion of the interview, the Examiner indicated that the proposed amendment, which clarifies that the truth indicators are compared to a numerical indication of prognosis output by the classifier, would likely overcome the outstanding rejection of the claims.

Amended Claim 1 is directed to a method of processing medical image data to determine a prognosis of recovery, comprising: (1) obtaining segmented image data of a portion of the medical image data corresponding to an abnormality; (2) extracting at least one abnormality feature from the segmented image data corresponding to the abnormality; and (3) determining the prognosis of recovery based on the extracted at least one abnormality feature, wherein the prognosis of recovery includes an indication of the likelihood of survival of a subject. Further, Claim 1 clarifies that the determining step comprises applying the at least one abnormality feature to a classifier trained in relation to the at least one abnormality feature obtained from at least one set of previously obtained medical data including medical image data and a set of truth indicators, the set of truth indicators including at least one of lymph node involvement, presence of metastatic disease, and presence of local recurrence. Further, Claim 1 has been amended to clarifier that the classifier is trained by comparing at least one of the truth indicators to a numerical indication of prognosis output by the classifier. The changes to Claim 1 are supported by the originally filed specification and do not add new matter.[1]

Applicants respectfully submit that the rejection of Claim 1 is rendered moot by the present amendment to that claim. However, since Claim 1 was previously amended to incorporate limitations recited in dependent Claim 14, Applicants will address the rejections cited in the rejection of Claim 14.

Regarding the rejection of Claim 14, the Office Action asserts that the '362 patent and the Ohno-Machado et al. reference disclose everything in Claim 14 with the exception of "using lymph node involvement as a truth indicator," and relies on the Ravdin et al. reference to remedy that deficiency.

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[1] See, e.g., Figure 5 and the discussion related thereto in the specification.

The '362 patent is directed to a method for enhancing visualization of a mammographic image including the steps of identifying in the image an anatomically dense portion of the image and processing the dense portion to produce a processed image having a more uniform density. As shown in Figure 1, the '362 patent discloses that the method includes the step of digitizing a mammogram, segmenting the border of the breast region, and performing a histogram analysis within a region of interest to ultimately determine the percentage of dense portions.

However, as admitted in the outstanding Office Action, the '362 patent fails to disclose determining the prognosis of recovery based on at least one extracted abnormality feature, wherein the process of recovery includes an indication of the likelihood of survival of a subject, as recited in amended Claim 1. Further, as admitted in the outstanding Office Action, the '362 patent fails to disclose that the determining step includes applying at least one abnormality feature to a classifier trained in relation to the at least one abnormality feature obtained from at least one set of previously obtained medical image data including medical image data and a set of truth indicators, the set of truth indicators including at least one of a lymph node involvement, presence of metastatic disease, and presence of local recurrence, as recited in amended Claim 1. Further, Applicants respectfully submit that the '362 patent fails to disclose that <u>the classifier is trained by comparing at least one of the truth indicators to a numerical indication of prognosis output by the classifier</u>, as recited in amended Claim 1.

The <u>Ohno-Machado et al.</u> reference is directed to a neural network for predicting survival of patients with AIDs. In particular, the <u>Ohno-Machado et al.</u> reference discloses that the output of a neural network corresponds to the probability of survival in a given year, while inputs are values of demographic, clinical, and laboratory variables.

However, as admitted in the outstanding Office Action, the <u>Ohno-Machado et al.</u> reference fails to disclose a determining step that includes applying at least one abnormality feature to a classifier trained in relation to the at least one abnormality feature in a set of truth indicators including at least one of lymph node involvement, presence of metastatic disease, and presence of local recurrence, as recited in amended Claim 1. Further, Applicants respectfully submit that the <u>Ohno-Machado et al.</u> reference fails to disclose that <u>the classifier is trained by comparing at least one of the truth indicators to a numerical indication of prognosis output by the classifier</u>. Rather, Applicants note that the <u>Ohno-Machado et al.</u> reference does not disclose truth indicators in Table 2 that are used to train the classifier, but shows a list of independent variables that may serve as inputs to the neural network. The <u>Ohno-Machado et al.</u> reference discloses that the dependent or truth variable was death due to AIDS.[2]

The <u>Ravdin et al.</u> reference is directed to a neural network that is used to predict outcomes for individual breast cancer patients. As shown in Table 2 and in Figure 2, the <u>Ravdin et al.</u> reference discloses that the input values to the neural network include age, tumor size, and number of involved nodes. However, Applicants respectfully submit that the <u>Ravdin et al.</u> reference fails to disclose the step of determining the prognosis of recovery by applying at least one abnormality feature to a classifier trained in relation to the least one abnormality feature and a set of truth indicators including at least one of lymph node involvement, presence of metastatic disease, and presence of local recurrence, wherein <u>the classifier is trained by comparing at least one of the truth indicators to a numerical indication of prognosis output by the classifier</u>, as recited in amended Claim 1. Rather, as disclosed on page 289, the <u>Ravdin et al.</u> reference discloses that death is used as the truth indicator to train the neural network. The <u>Ravdin et al.</u> reference does not disclose that a lymph node

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[2] See the materials and method section of the <u>Ohno-Machado et al.</u> reference.

involvement is used as a truth indicator. Rather, the number of involved nodes is used as input to the neural network in the <u>Ravdin et al.</u> system.

Thus, no matter how the teachings of the '362 patent, the <u>Ohno-Machado et al.</u> reference, and the <u>Ravdin et al.</u> reference are combined, the combination does not teach or suggest determining the prognosis of recovery by applying at least one abnormality feature to a classifier trained in relation to at least one abnormality feature obtained from at least one set of previously obtained medical data including medical image data and a set of truth indicators, the set of truth indicators including at least one of lymph node involvement, presence of metastatic disease, and presence of local recurrence, wherein <u>the classifier is trained by comparing at least one of the truth indicators to a numerical indication of prognosis output by the classifier</u>, as recited in amended Claim 1 . Accordingly, Applicants respectfully submit that amended Claim 1 (and all similarly rejected dependent claims) patentably define over any proper combination of the '352 patent, the <u>Ohno-Machado et al.</u> reference, and the <u>Ravdin et al.</u> reference.

Independent Claim 17 is a method claim that recites the step of applying the at least one parenchyma feature to a classifier trained in relation to the at least one parenchyma feature obtained from at least one set of previously obtained medical data including medical image data and a set of truth indicators, the set of truth indicators including at least one of lymph node involvement, presence of metastatic disease, and presence of local recurrence, wherein <u>the classifier is trained by comparing at least one of the truth indicators to a numerical indication of prognosis output by the classifier</u>. As discussed above, the combined teachings of the '362 patent, the <u>Ohno-Machado et al.</u> reference, and the <u>Ravdin et al.</u> reference fail to disclose this limitation. Accordingly, Applicants respectfully submit that the rejection of Claim 17 is rendered moot.
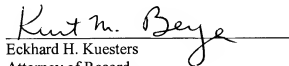
Regarding the rejection of dependent Claims 13 and 16 under 35 U.S.C. § 103,

Applicants respectfully submit that the '305 patent fails to remedy the deficiencies of the

'362 patent, the <u>Ohno-Machado et al.</u> reference, and the <u>Ravdin et al.</u> reference, as discussed

above. Accordingly, Applicants respectfully submit that the rejections of Claims 13 and 16

are rendered moot by the present amendment to Claim 1.

Thus, it is respectfully submitted that independent Claims 1 and 17 (and all associated

dependent claims) patentably define over any proper combination of the '362 patent, the '305

patent, the <u>Ohno-Machado et al.</u> reference, and the <u>Ravdin et al.</u> reference.

Consequently, in view of the present amendment and in light of the above discussion,

the outstanding grounds for rejection are believed to have been overcome. The application as

amended herewith is believed to be in condition for formal allowance. An early and

favorable action to that effect is respectfully requested.

Respectfully submitted,

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